# AUDIO BASICS

**A MONTHLY NEWSLETTER OF AUDIO INFORMATION**

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## An Open Letter To "Good Sounding" Cable Manufacturers

O.K. guys, we are really not stupid or deaf. We do realize that it is to our advantage to insure that our audio components are used to their maximum potential. The more faithful our equipment is to the source music the more people will like the results and the more equipment we will sell. Thus it is obvious that using interconnect cables or speaker wires that interfere with the performance of our equipment is contrary to our (and our client's) best interests and refusing to recommend or sell interconnects or cables that really are a more transparent window to the performance would be short changing all of us.

Of course this admission is true if, and only if, there really are cables and wires out there that are "better components" and that really do screw up the music less. Remember, the best we can do is to not screw up the source material. Any changes we make to the source material - even changes we temporarily like - have an easy to remember name. These changes are called distortion.

Now I have seen many quasi-technical dissertations out there recently purporting to show that different wire constructions have different pulse characteristics (of course they do, but at what frequencies, and under what test conditions?) Unless the tests are conducted with battery powered generators and oscilloscopes, any ripples seen on pulse tests are as likely to be grounding interactions as indications of cable merit. And, if you want to know more about adverse cable loads affecting amplifier performance, ask Polk Audio about their ill-fated Cobra Cables which tended to blow up output inductorless amplifiers - a cable and amplifier interaction that everybody could hear.

I am not sold on the purple prose advertising claims either. Unfortunately there have been claims made in the esoteric press that the brand and finish of the varnish you put on the wood planks holding your wires apart make just as much sonic wonderment as the type of wood and brand and construction of the cables themselves. And then there are the others that absolutely claim that extraneous transducers in the listening room foul the musical experience beyond repair too. You must use only one set of speakers and remove all other transducers (even the telephone). Obviously, to determine if this is really true, one would have to remove all the speakers and poke out one ear with an icepick to get down to the real purists' goal of only one vibrating membrane in the room (whoops -better cut your throat too to get rid of those vocal cords). Naturally this advice means that listening to live music is a futile endeavor - all those vibrating membranes from all those instruments - an impossible situation. Sorry guys, I can't get past the hype or the quasi-science. **But I am willing to re-evaluate my position based upon real evidence – the evidence that any interconnect cable or speaker wire can make a meaningful improvement in my listening experience in my own system. All you have to do to make a believer out of me is to send me some cable that allows me to hear the evidence.**


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For your information, the listening room is a really dead and stiff 26' x 17' x 8' room carpeted and draped with stiffened walls, a concrete slab floor, and lots of reflection absorbing treatment (everything from velvet to cork). Believe me, it is a good sounding room because it has very little sound of its own and it supports deep bass power without booming.

For loudspeakers we can choose the B&W Matrix 801s (with the crossovers rebuilt to eliminate magnetic interaction between the sections and crosstalk thru the protect circuits), most any of the smaller B&Ws, or Acoustat Spectra 11 electrostatics. The drive electronics are ours, and range from very inexpensive and very neutral solid state units to vacuum tube units of significant musical appeal, to our very best hybrid vacuum tube – power fet units that are capable of processing all the dynamic range and "aliveness" of the musical experience best of all. All amplifiers are stable into huge inductive or capacitive loads and all preamps will drive a standard IHF load (10,000 ohms in parallel with 1000 picofarads) so that significantly strange cable or wire load characteristics will have no affect on the linearity of our driving electronics.

We will need two speaker wire runs of about 25 feet each terminated to fit into heavy duty 5-way binding posts at each end. We will need two sets of interconnect cables terminated in RCA phono plugs, one set to run between the preamp and the power amp, and a second set to run between the source (CD, tuner, phono, or digital tape) and the preamp. Each should be 3 feet to 6 feet long. We will need the capability to separate the two conductors by about a foot at each end, depending upon the amplifier configuration so don't supply cables or wire that preclude this possibility. You will need to donate the cables to me because I simply cannot afford to pay for all those really expense wires out there. You will not get them back in one piece because we will cut up the wires and cables as a last step in our evaluation process to evaluate the construction and to see how well the wires are terminated to their connection plugs. I will return the wires and cables to you at the end of the evaluation process or pay your retail price for any we find so useful we want to keep for ourselves.

There is almost no downside risk for you, cable manufacturer. I will not say anything nasty in print about any specific brand as long as its mechanical configuration is not hazardous to the reliable operation of the equipment. I will not tolerate out of spec RCA plugs that deform or fit loosely in standard RCA jacks and speaker wires terminated in fuzzballs or spade lugs that are so oversize that they can easily inadvertently short together. Other than that, I will only report good news - cables or speaker wires that tell me I am wrong in suggesting that premium cables are not useful. Hey guys, I have been giving away thousands of dollars in profits and turning off audiophile customers because we have not been willing to sanction what we (so far) have been unable to hear or measure. **I really want a good sounding brand of cables and wires to sell! The only condition - it actually has to show me that it really is "good sounding"** and is reliable.

How are we going to test your cable? First we are going to measure its resistance, capacitance and inductance to see if there are any unusual basic electrical characteristics. Then we are going to plug them in and sit back and relax and enjoy the music. You will be "competing" with an old (late 1970s) set of Monster Cables (they have stood up to lots of plugging and unplugging without breaking) or with plain hardware store 16 gauge lampcord and with a variety of interconnects acquired over the years ranging from early Fulton Cables (the plugs broke) to Cotter Cables (the third ground induces excess RFI) to our normal assortment of Radio Shack and old Dynaco supplied cables.

We will use the same listening evaluation process that we do with prototype electronics designs. We will use (or randomly not use) the cable or wire first on one channel only with the system switched to mono. The party making the connections will do it at random and leave the listening room without telling us what is connected (or not connected). We will then use white noise and music to try and determine if there are any differences at all we can perceive between the two channels. White noise is a really useful tool here because it is a sustained and repeatable signal, unlike music which is always changing in content from moment to moment. We have also come up with a methodology of placing a matched set of speakers in our very non-reflective room so that we can listen to either exactly on axis at the same time, getting rid of the considerable frequency response variations that occur with even the best speakers as you move even slightly off access to either. If then there are repeatable white noise differences that seem to be simply differences in level (a lower resistance speaker wire will sound slightly louder) we will have the cable installer come back and adjust the balance control to equalize input levels to the speakers (measured at their terminals). Then if we still seem to hear differences between the channels (on white noise or music) we will try and judge if they are "better - worse" differences using a variety of musical samples we like to listen to because we keep hearing more and more music in them as the system really becomes more transparent. And finally we will see what cables we are listening to. This procedure tends to keep us honest. No, we won't use switchboxes to make instant A-B tests (their common grounds cause indeterminate interactions between the devices under test and we have a great deal of trouble making any value judgements at all on a instant A-B basis – it just isn't the way we listen to music in the real world). Finally we will simply stuff in the cables in a complete stereo setup and use them for a few days. Sometimes it takes a while for irritations in the music (or lack of irritations) to sink in.

Finally after we have had time to repeat this process with all cables and speaker wires we receive, we will write herein of any cables or wires that we used that actually seem to enhance our listening enjoyment. We will also recommend said cable (if any) to you dear readers, and let you know why. Obviously we will try and arrange to sell the cables and wires too if we find something really worthwhile, we do have to earn a living.

So there, dear cable manufacturer, help us eat crow. Put some action where your mouth is. Don't just write letters to *Audio* complaining that we have slurred you. Send us some cable and speaker wire samples and see if you can help us prove we were wrong. Remember (outside of reporting on inept mechanical construction) I am not going to tell the world I don't like your cable. Actually, if I hear cables I don't like that proves I am wrong in any event, as it would prove that there is something about cables we can hear that we don't understand. However, I will only report on those cables (if any) that I do like. I am not one to turn down the opportunity to earn an honest profit and to add value to my clients' audio systems. Give me the chance to do it. However, unfortunately, I suspect you won't. I am going to be surprised if we see even a single sample of wire or cable from a hi-fi supplier. **No, private readers, don't send me your own "pet" exotic cables** - I cannot deal in one-offs or stuff not in current production or wires or cables modified or abused subsequent to its purchase. To be fair I must have factory supplied fresh samples only. I think many esoteric suppliers would rather complain about my *Audio* editorial than to provide me with the evidence to make me change my mind. I hope this isn't the case. I hope you cable suppliers really have something good. There is room for more good work in the quest for true high fidelity. I want to hear your best offerings.

*Frank Van Alstine*

## Stock Used Dyna St-70 Transformers for Sale, Cheap!

Because we have installed our new high current Super Seventy power transformer in several working St-70 units here for clients and for outright Super Seventy sales, we now have several spare used but good original Dyna St-70 power transformers available.

These originals are available to you for replacement repair parts for $30.00 each (absolutely as is – no warranty) plus $12.00 shipping in the continental U.S.A. We have tried to salvage as much transformer lead as possible when removing these units, but you may need to make splices in some instances.

**We also have complete tested used original stock St-70 units available for $150.00 each plus $18.00 shipping.** Do not assume that these units will contain a full working tube set. We temporarily installed good tubes to test the units for gross defects, but you will have to retube the units to make them functional.

## Thank You for Writing Audio Amateur

But, unfortunately it isn't doing any good. We keep finding out more bad news regarding the *Glass Audio* review. First, there are two versions of the review floating around and being handed out by our competitors. One version has a bad subjective summary of the GSI St-70, another version has that summary changed to be a glowing report. It appears that other manufacturers could get opinions revised, but we cannot get facts published correctly. Second, they are reporting that the amp reviewed was not the one we acquired back. Yes, we know the PC card had gone in and out and in again, but the problem is the PC card work - that's where the worst mistakes are and that is as reviewed - miswired and defective. The ethics of this situation are profoundly disturbing.

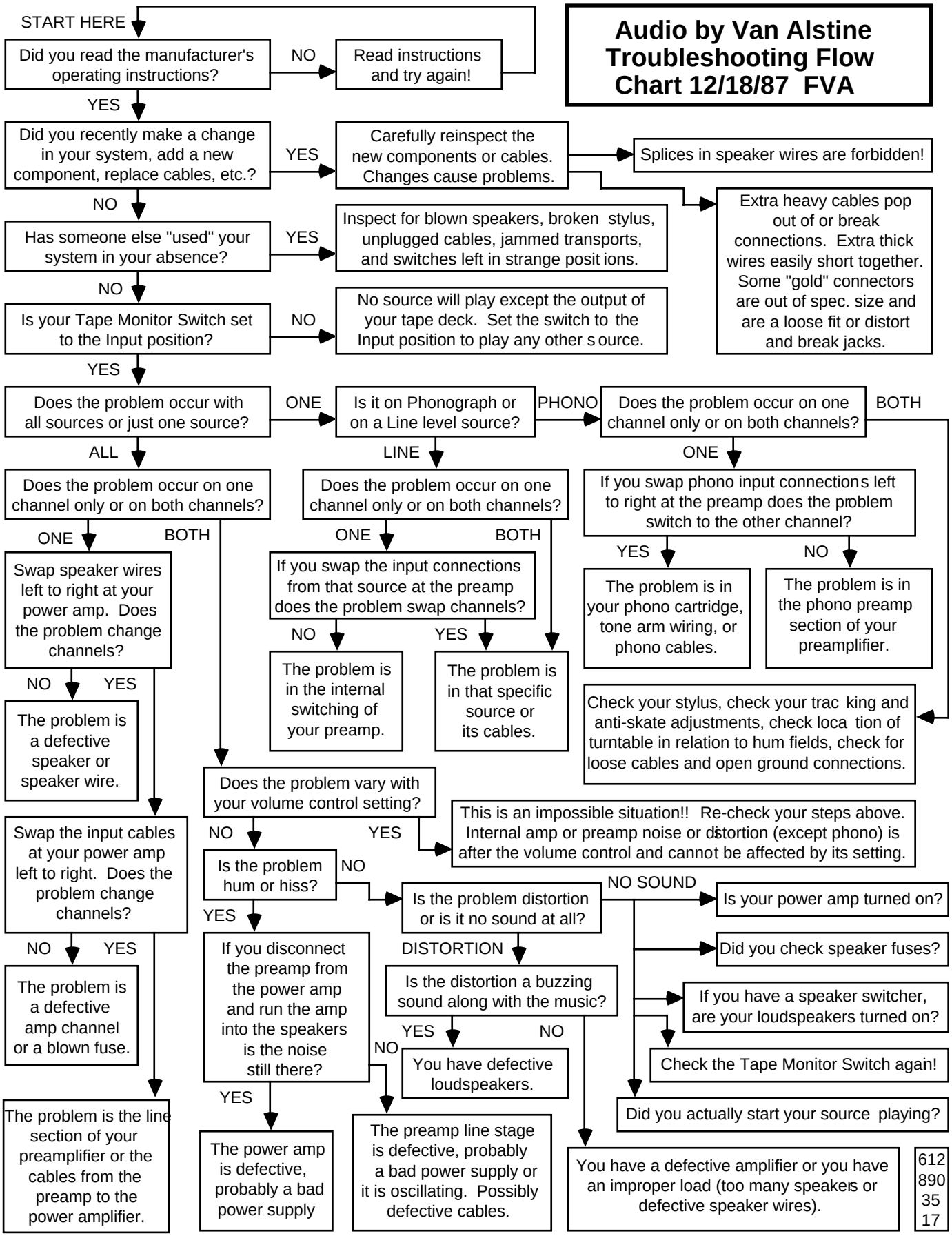
## Troubleshooting Revisited

We continue to get so many "non-repair" jobs here and complaints about nonexistent system problems that it is obviously time to republish our Troubleshooting flow Chart from the December, 1987 issue of *Audio Basics.*

To use this chart **(I would really like all of you to work your way through it)** you simply start at the upper left corner and follow the "yes" or "no" arrows depending upon how you answer the question in the appropriate box. It is simply amazing how many people call to complain about absolutely impossible problems when a simple reading of this chart (which we provide with all equipment shipments) and making a few simple tests would save them and us lots of time, money, and anguish.

For example, recently one fellow called to report that one channel on his amplifier system had "blown out" after playing the Telarc 1812 cannons. We asked him how he was sure it was the amplifier that had the problem. He didn't remember how he had isolated the problem, but "it didn't matter because he already had it packed up ready to ship back to us for warranty service." When I urged the client to unpack the amp and make a few basic tests per this chart, I was told it would be "inconvenient" for him to do so. So he sent the amp to us based upon his guesses. He was wrong, the amp was in perfect working order. When we reported that to him, he then sent his preamp. Of course that was in perfect working order too. We returned both units and that is when he finally checked things out and discovered a blown in line fuse in his speaker cable. So, dear readers, is it more "inconvenient" to take a few minutes and make a few basic tests, or to pack up and ship an amp and a preamp across the country and back and pay for the shipping and bench time? I suggest that a bit of basic troubleshooting before shipping is much less inconvenient. Please help us to help you best.

# Audio by Van Alstine Troubleshooting Flow Chart 12/18/87 FVA

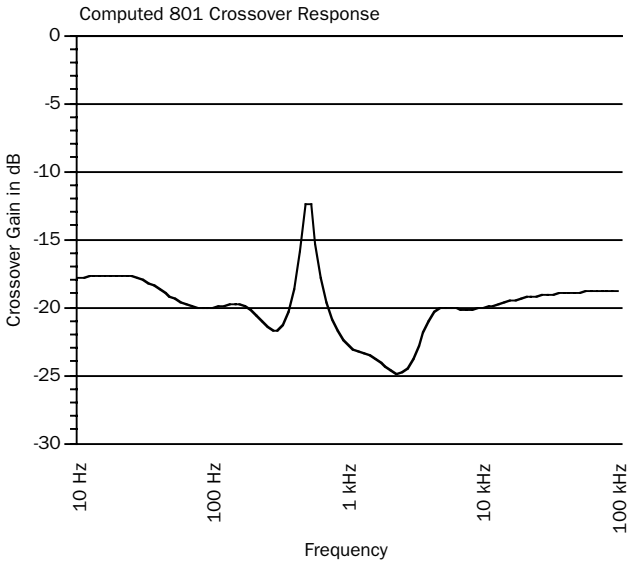


## Further Explorations of the B&W 801 Matrix Crossover

Now is the time for you to dig out last month's *Audio Basics* because you are going to need the 801 crossover diagrams contained therein to follow this additional data.

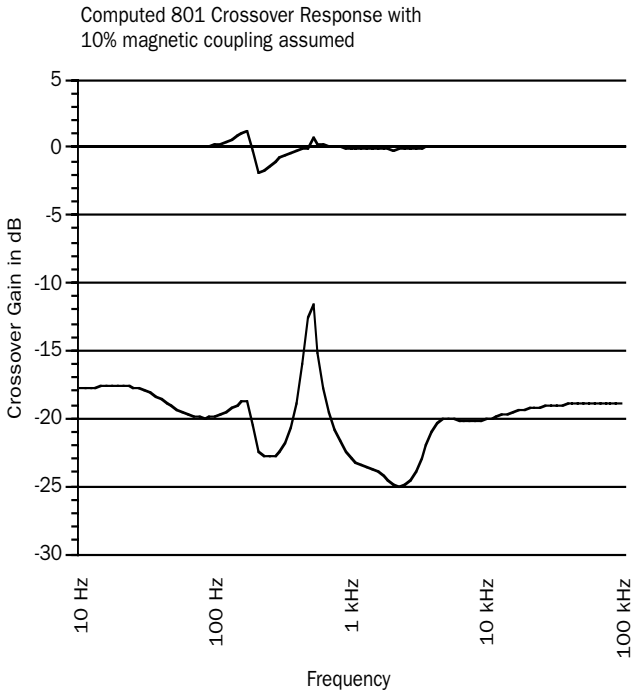
If you remember, we told you that there seems to be a design lapse in the execution of the Matrix 801 crossover board. Two inductors are physically aligned such that extraneous magnetic coupling between the crossover sections is occurring. We suggested relocating one of those inductors to mitigate the situation. Now our computer has been busy running a reasonably thorough analysis of the crossover circuit Aado has programmed Mathematica to provide circuit analysis with no rounding errors on the Macintosh, something that no off the shelf program will do on any PC we are aware of.

Anyway the first graph below shows our theoretical computed frequency response of the 801 crossover, assuming that no extraneous coupling is happening.




**Note that this is the calculated crossover response, not the loudspeaker response.** Obviously the relative efficiency and the real world frequency response of the drivers, the cabinet design, and its loading will strongly modify the actual acoustical response of the loudspeaker system as a whole. These curves show the drive to the speakers, not the output of the speakers.

Now what happens if we add the perceived magnetic coupling to the equation? That is easy to do, we model the two coils in question as a transformer with about 10% coupling to simulate the actual characteristics we observed. The following graph shows the effect of the coil coupling at the top, and the overall crossover curve with this effect added in at the bottom. Note that the coupling makes the bass drive less linear and adds a little peak to the midrange drive. Note also that the tweeter drive is a bit bumped up in the 6 to 7 kHz region on both graphs.




Another way to evaluate these curves would be to note that if you relocate the coil to reduce the coupling, you would hear less mid-bass output from the speaker, slightly less peaky mids, and perhaps a smoother mid to bass response, but with bass not quite as robust as desired. You might be more aware of the slight high frequency emphasis too. The situation is not perfect.

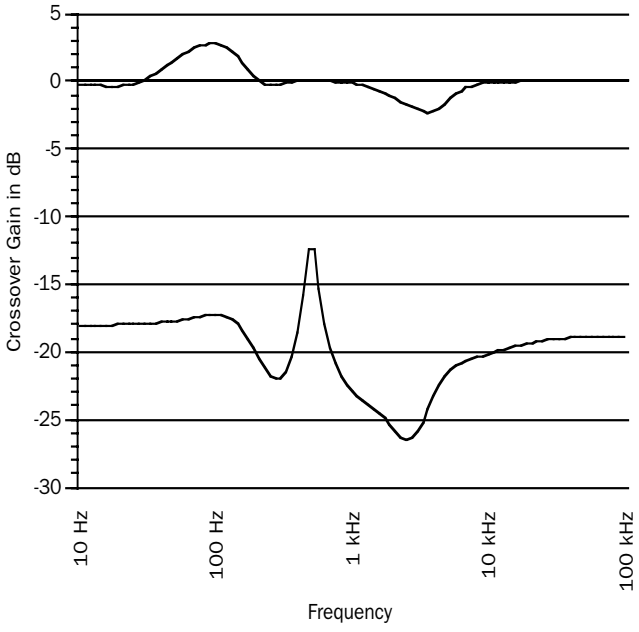
A qualified unnamed source has suggested an electrical change to the crossover. The suggestion came before we started this investigation – a change suggested for "bright" room use. But it appears that this change serendipitously dovetails into what we want the loudspeaker to do. Here is the suggestion:

1. Open the R2 - C11 - L8 series string in the bass crossover. The easiest way to do this is to unsolder and lift one leg of capacitor C11.

2. Install a 1 ohm 10 watt resistor in series with L1 in the tweeter crossover. You can do this by unsoldering and lifting the outer leg of L1 and soldering in the resistor between that dangling leg and its place on the PC card or by cutting foil and installing the resistor across the foil on the bottom of the card.

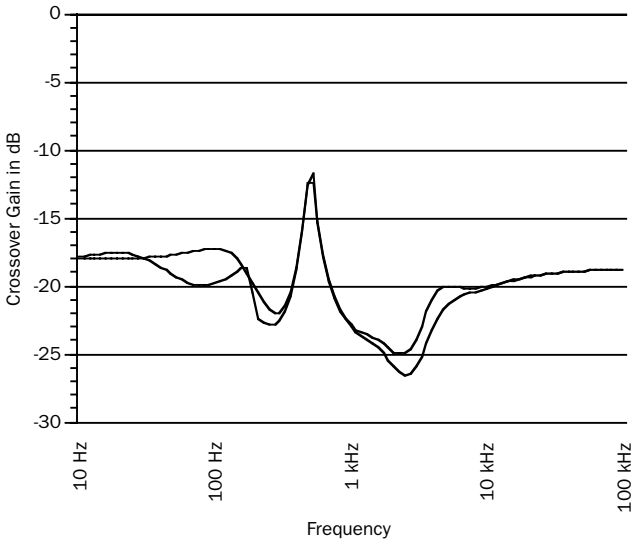
The following graph shows the effect of this change at the top, and shows the calculated combined effect of moving the crossover coils suggested last month along with making the suggested circuit changes at the bottom.

Computed 801 Crossover Response with magnetic coupling removed and circuit changes made.




Note that this circuit change has done several things. First the bass drive is much smoother and overall stronger. Second, the drive to the midrange speaker is less peaky. Third, the drive to the tweeter is smoother, and slightly reduced. The following graph shows the calculated stock drive (taking the undesireable magnetic coupling into consideration) in black and shows the calculated crossover frequency response after all fixes in grey.

Original 801 Crossover Gain compared to Modified 801 Crossover Gain




We have completed all these changes to my 801 Matrix units and I can report there is no question about the validity of the computations. The sonic improvements in the speakers are significant. The speaker is much clearer, and more "user friendly." The touch of dryness is gone, and female voice becomes simply lush. Great performance becomes better yet. Dave Umeda gave one listen and went home and reworked his Matrix 801s too. This has been a rewarding project - and of course we will do it for you at no extra charge when you buy 801s from us. One last thought – we did get a chance to look at the crossover in the Matrix 802 and its layout is different. There are no coils directly in line with each other so I doubt if that design warrants the time we have put into the 801s. We sure are enjoying the results of this work.

## THE USED AVA EQUIPMENT LIST

Remember the rules. These are units we are selling to credit our clients' accounts towards their purchase of even better Audio by Van Alstine equipment.

Each of these units has been bench and system checked by us as if it was new and carries our 30 day satisfaction guarantee subject to a 15% restocking charge. Each unit carries at least a 90 day warranty (check each listing). Each item is a one-off special value. If you see what you have been looking for call us promptly. Note that this is nearly a complete new selection. All units but one from the December, 1989 listing have already sold. Owners of sold equipment, remember that we are waiting for the 30 day satisfaction return to expire before crediting your account.

1. **Transcendence Two 110 preamplifier** (new 4/87) our very best discrete solid state audio circuits in excellent condition (current black chassis with white letters and red accents) (with shipping carton and accessories). New cost $900, sale price $595.00. 6 m. warranty.

2. **Mos-Fet 240D amplifier.** 120 watt per channel most recent AVA circuit set built new 6/88. Excellent condition, new black AVA faceplate. Our best selling high power amplifier. New price $550, sale price $395.00. 6 m. warranty.

3. **Mos-Fet 200B amplfiier.** 120 watt per channel high current amplifier in the rugged Hafler DH-200 chassis. Built by AVA in June, 1984 but still in excellent physical and electrical condition. Just checked out and upgraded by AVA for lower noise operation. A great sounding amplifier now working better than new. $295.00. 3 m. warranty.

4. **Fet Three 101 preamplifier.** A very nice basic Hafler preamplifier chassis with the AVA Fet Three high performance circuit set installed in January, 1989. A full function unit with tone controls and dual tape monitors (the EPL jacks are disconnected). Pair this with the Mos-Fet 200B amplifier mentioned above and have a high end, high power, and reliable component system at a fraction of the new price. Sale price $195.00. 3 m. warranty.

5. **VA Systems Model One preamplfier.** The original "high-end" straight line preamplifier in great physical and electrical condition. Patented "no feedback" RIAA circuits. Still a very good sounding (smooth and tubelike) preamp. Handles phono, tape, tuner, and CD. Attractive low profile custom built chassis. New price $600.00, sale price $185.00! 6 m. warranty.

Call us promptly at 612 890-3517 about these special values. Each will be placed with the right new owner and each will make that person's audio system more rewarding.

## Thank You for Your Renewal!

We have the highest percentage of renewals this year than ever before. Your support and the many kind letters and notes that have been coming in with your renewal checks makes us feel really good about keeping *Audio Basics* going. It is a lot easier to write when it is obvious that so many of you are really interested in what we have to say. Please check that renewal number on you mailing list. If it says 9001 or 9002 its time to renew now. If it still says 8912 or earlier – well, then you won't be reading this, will you? However, we will be sending a "tickler" out to those that forgot – we don't give up easily so perhaps they will get this after all.

*Frank and Darlene Van Alstine*